

# Decentralized Propaganda in the Era of Digital Media: The Massive Presence of the Chinese State on Douyin

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## Abstract

The rise of social media in the digital era poses unprecedented challenges to authoritarian regimes that aim to influence public attitudes and behaviors. In this paper, we argue that authoritarian regimes have adopted a decentralized approach to producing and disseminating propaganda on social media. In this model, tens of thousands of government workers and insiders, primarily non-media professionals, are mobilized to produce and disseminate propaganda, and content flows in a multi-directional, rather than a top-down manner. We empirically demonstrate the existence of this new model in China by creating a novel dataset of over five million videos from over 18,000 regime-affiliated accounts on Douyin, the Chinese branding for TikTok. This paper supplements prevailing understandings of propaganda by showing theoretically and empirically how digital technologies are changing not only the content of propaganda but also the way in which propaganda materials are produced and disseminated.

**Keywords:** Propaganda, social media, video-sharing platform, China, Douyin, computer vision

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# 1 Introduction

Digital media hinders the ability of authoritarian regimes to reach broad audiences. Although digital media—platforms, websites, electronic devices—has enabled authoritarian regimes to expand the scope and specificity of censorship (Kalathil and Boas 2010; King, Pan and Roberts 2013; Morozov 2012), surveillance (Qin, Strömberg and Wu 2017; Xu 2021), and repression (Earl, Maher and Pan 2022; Gohdes 2024; Pan, Xu and Xu 2023), it has resulted in a vast explosion of data that has fragmented audiences into niche online spaces that serve highly specialized interests (Chadwick, Dennis and Smith 2015). For instance, in a group of a hundred individuals, each may be immersed in a distinct online world—from politics and powerlifting to cat feeding and coding—therefore, a topic deemed “viral” by one person might go unnoticed by the remaining ninety-nine. This means that even high-capacity authoritarian regimes with control over traditional media—e.g., state-run television, radio, newspapers—may find it a challenge to reach broad audiences with its propaganda. This challenge of reach cannot be solved by implementing selective censorship (King, Pan and Roberts 2013), having highly influential social media accounts (Woolley 2022), producing high quality soft propaganda (Mattingly and Yao 2022), or influencing ranking and recommendation algorithms (Bolsover and Howard 2019).

In this paper, we argue that in the context of digital media, authoritarian regimes are changing their propaganda systems—systems intended to control and influence the public. Even though the effectiveness of traditional, centralized or top-down, modes of disseminating propaganda has been undermined by digital media, digital media enables a different propaganda system—what we call a decentralized propaganda model—because it lowers entry costs, provides incentives, and enables easier monitoring of a massive amount of content in authoritarian contexts with mobilization power and centralized capacity for control. A decentralized propaganda model is one that dramatically increases the number of propaganda producers, each possessing unique interests and knowledge, and produces large quantities and varieties of content aiming to reach broad audiences. While there was decentralization of propaganda in the era of traditional media, it relied on media commercialization whereas social media allows authoritarian governments to decentralize propaganda production without commercialization at a scale far beyond what has been observed in the past.

We find evidence of a decentralized propaganda model in China on Douyin, a short-form video-sharing platform similar to TikTok and also owned by Bytedance. Douyin has over 750 million monthly active users as of 2023 and is the fastest growing social media platform in China and in the world.<sup>1</sup> We identify 21,408 accounts affiliated with the Chinese Communist Party (CCP) and the Chinese government on Douyin.<sup>2</sup> Among active accounts, only 24.1% are affiliated with state media outlets, and 11.5% are affiliated with propaganda departments, which are the professional bureaucracies that have been in charge of propaganda efforts in the past. The remaining 64.4% of accounts are run by bureaucracies not traditionally staffed with media professionals, including security apparatus, firefighters, government offices, Youth Leagues, and other Chinese state agencies. Regime-affiliated accounts actively create a large number of videos, averaging 275 videos per account in one year.

Immediate feedback mechanisms on social media, such as likes, shares, and comments, may provide additional motivation for creating propaganda. This feedback can be fulfilling for some creators and motivate them to make original content. The demand from both audiences and higher-level officials for content originality, combined with the broad interests, preferences, and knowledge of a large number of propagandists, as well as easier access to abundant resources and materials, encourages the production of original and diverse propaganda content. We identify and collect 5.14 million videos from regime-affiliated accounts active between June 1, 2020 and June 2021. By applying a Convolutional Neural Network (CNN)-based frame-to-frame video similarity learning framework to compare the similarity of videos from various levels of government on sampled days, we find evidence indicative of content diversity. We observed low visual similarity among videos produced by different government agencies. Specifically, 69% of videos created by central government accounts were not replicated by local accounts. Moreover, 84.4% of videos created by provincial-level accounts, 85.2% of videos created by city-level accounts, and 85.2% of videos created by county-level accounts do not have central video matches. This is not what we would

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<sup>1</sup>See <https://www.statista.com/statistics/1361354/china-monthly-active-users-of-douyin-chinese-tiktok/> (Accessed March 5, 2024).

<sup>2</sup>From the 2020 reports of the China Internet Network Information Center, a state-run entity, there were 25,313 government affiliated accounts on Douyin, 82,216 on Toutiao, 141,000 on Weibo. This indicates that our data collection on Douyin is relatively comprehensive and also suggests that the activities of CCP-affiliated accounts on Douyin are part of a broader trend of establishing a regime presence on social media platforms.

observe in a propaganda system where local levels faithfully reproduce and repeat the word of the center. Instead, this indicates a significant level of originality and diversity in the propaganda content generated across different government levels.

The challenge of any decentralized system is the ability to monitor and control agents who may have interests that diverge from that of the principal. We argue that social media allows principals to control a large number of agents with diverse interests to create propaganda content that aligns with the principal's preferences. Social media substantially lower the cost of content creation, meaning that the principal does not need to rely on media commercialization to motivate agents who are media professionals to produce content. Avoiding media commercialization reduces divergence in interests among agents. More importantly, the public visibility of posts and metrics on social media allows principals to monitor agents and enforce content guidelines with much greater ease. To demonstrate that regime-affiliated accounts are indeed producing propaganda content, we conducted a manual video-based content analysis on a random sample of 18,571 videos from regime-affiliated accounts. We also conducted the same analysis on 8,028 trending videos made by regime-affiliated and non-regime-affiliated accounts in the same time period. Our findings reveal that content composition is consistent across regime-affiliated accounts at different levels, with nearly 49% of the content related to propaganda, including promoting China as a moral society, stoking nationalism, and promoting party-line propaganda. Purely entertainment-focused videos, perhaps aimed solely at generating traffic, only account for less than 30% of both trending and non-trending videos created by regime-affiliated accounts. In contrast, 86.2% of trending videos created by non-regime-affiliated accounts contain purely entertainment-focused content.

The interconnectivity of social media further facilitates a decentralized system by enabling the principal to source propaganda content from a large number of agents who are actively producing propaganda. Social media accounts can easily share content among themselves, which means that a decentralized propaganda model involves content flow not only from central accounts to peripheral accounts but, importantly, from peripheral to central accounts. Indeed, we find 59,619 central-local matched videos in the sampled days, and the majority—55%—were initially posted by local accounts, whereas only 45% were first posted by central accounts. This is not only evidence of multidirectional content flows but also of content originality.



We find evidence of a decentralized propaganda system with significant volumes of diverse, original propaganda content on Douyin. We also show that central accounts copy local content. By analyzing user engagement with videos from regime-affiliated accounts, we find that videos from central-level accounts copied from lower-level accounts have much higher user engagement than videos originating from central-level accounts. Additionally, the copied content is mainly propaganda. This pattern is unlikely to be driven by Douyin algorithms, because even if the algorithms prioritized central-level videos, we still observe significant differences in the popularity of central-level videos that originated from local accounts compared to those that originated from central accounts. This evidence suggests that decentralized content production enables local agents to produce interesting and engaging content and allows central-level accounts to copy and disseminate such content to reach more people. This implies that, on digital platforms, the decentralized propaganda model may be more effective than a top-down content distribution system, where the central-level accounts are the main producers of propaganda.

When combined with censorship and algorithmic promotion, this decentralized propaganda model can systematically affect content distribution on social media platforms. Censorship removes objectionable content. Decentralized propaganda production provides propaganda content that is appealing and can thus be algorithmically promoted without turning users away from the platform. This is evidenced by a considerable proportion of trending videos originating from accounts associated with the regime. For instance, [Lu and Pan \(2022\)](#) observe that 42.5% of trending videos were sourced with regime-affiliated accounts; these videos contain significantly higher levels of propaganda content than those produced by non-regime accounts. Although this new propaganda system may not rival the vast number of private content creators in attracting social media audiences, our analysis indicates that it is more effective than merely transplanting a centralized, top-down propaganda system onto social media. This evolution suggests a strategic adaptation of state propaganda to the new information environment in the social media era.

The rest of the paper proceeds as follows. Section 2 introduces the decentralized propaganda system. Section 3 details our data and methods. Section 4 presents our results, and Section 5 concludes.

## 2 Government Propaganda in the Age of Digital Media

This study focuses on propaganda systems—system of rules, incentives, and resources created with the intent of controlling and influencing attitudes, opinions, and/or behavior in the public sphere—under authoritarian rule, where those in power have control over media and communications. We define propaganda as content produced by a propaganda system with the intent of positively influencing public attitudes, preferences, and behaviors toward the regime. This definition builds on conceptions of propaganda related to the spread of biased information with the goal of shaping attitudes, beliefs, or behavior (Woolley 2023). Some scholars offer alternative definitions of propaganda based on source—as everything produced by state media (source) (e.g., Pan, Shao and Xu 2021; Bleck and Michelitch 2017). Others define propaganda based on its effects, including its ability to persuade and alter beliefs (Adena et al. 2015; Barber and Miller 2019; Mattingly and Yao 2022; Peisakhin and Rozenas 2018; Treisman 2011; Yanagizawa-Drott 2014), as well as its ability to change behavior by signaling power (Carter and Carter 2021a,b; Huang 2015, 2018; Little 2017). We do not define propaganda based on source because it can entail an extremely broad range of content, such that everything becomes propaganda, which muddies the concept. We do not define propaganda based on effect because we do not want to preclude content based on its effectiveness or quality.

When we define propaganda based on intent, it means that not everything produced by state-media would meet the definition of propaganda. For example, a state-media outlet could report on the weather, broadcast a children’s program on insects, or run advertisements to boost local tourism, and as long as these programs are not intended to make audiences view the government more positively, it would not be considered propaganda. Furthermore, it means that not everything produced by a propaganda system is necessarily propaganda. For example, a propaganda system may contain incentives that lead those in the system to produce content aimed at capturing attention instead of influencing attitudes or preferences. Under our definition, content created with the sole purpose of capturing public attention would not constitute propaganda.<sup>3</sup>

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<sup>3</sup>See, for examples, Field et al. (2018); King, Pan and Roberts (2017); Roberts (2018); Rozenas and Stukal (2019).

## 2.1 New Challenges for Authoritarian Information Control

Digital media has led to an exponential increase in the number of information sources available to audiences. As of the beginning of 2022, it was estimated that digital data had exceeded 44 zettabytes (one zettabyte has 21 zeros) and that by 2025, each day 463 exabytes (1 exabyte is 1 billion GB) of data would be generated (Renieris 2022). In the era of broadcast media, audiences had a relatively narrow set of media choices. With digital media, consumers face an ultra-high-choice environment, with countless content producers—from media outlets to ordinary people—competing for limited audience attention (Chadwick 2017; Fletcher and Nielsen 2017; Webster and Ksiazek 2012). Individuals face an abundance of content options and cannot consume all available information, thus, they reside digitally in fragmented communities that fulfill highly specialized interests, consuming narrow slices of available content often driven by recommendation and ranking algorithms (Guess et al. 2023). As a result, the content each person engages with varies significantly, to the extent that what appears “viral,” by which we mean gain rapid popularity (Bakshy et al. 2012; Cheng et al. 2014; Goel et al. 2016; Ugander et al. 2011), to some individuals may be entirely unnoticed by others.

The effectiveness of traditional, centralized or top-down, modes of disseminating propaganda has thus been undermined. In the era of broadcast media, Authoritarian regimes could effectively disseminate their messages to the public and capture public attention by monopolizing the narrow set of media channels through state ownership of media outlets, as well as co-optation and intimidation of media owners and journalists (Bleck and Michelitch 2017; Enikolopov and Petrova 2015; McMillan and Zoido 2004; Oates and McCormack 2010; Qin, Strömberg and Wu 2018; Stockmann 2010; Zhao 1998). In the era of digital media, state control of the most popular media outlets does not guarantee that a sizable audience may be reached at any given time. For example, suppose a government social media account, such as the *People’s Daily* and CCTV News on Sina Weibo, has 100 million followers, when a post is made from this account, not all 100 million people are going to see it. The average number of views any particular piece of content will receive depends on the characteristics of the social media platform (e.g., is it network-based such as Facebook or more algorithmic such as TikTok), ranking algorithms, prior audience interest in

such content, the attractiveness of the content itself, and the interaction of all these factors (e.g., algorithms are personalized and may make recommendations to certain users based on their prior views and clicks).

The strategy of employing alternative content styles such as “soft propaganda” to compete in the high-choice digital environment by making specific pieces of propaganda more appealing (Mattingly and Yao 2022) also does not guarantee that a broad audience will be reached. If we assume that the best soft propaganda content is the equivalent of a blockbuster action movie, while such a movie may be appealing to many, it will not appeal to all. Furthermore, propaganda often requires repeated and continued exposure to bring about intended effects rather than a one shot blockbuster (Jowett and O’donnell 2018). As a result, highly popular social media accounts and slickly produced content will not consistently guarantee broad reach.

Censorship is not sufficient for overcoming these challenges. Information suppression removes dissenting voices and alternative perspectives (Earl, Maher and Pan 2022; Kalathil and Boas 2010; King, Pan and Roberts 2013; Morozov 2012; Pan 2017; Pan and Siegel 2020; Pearce and Kendzior 2012). However, autocrats and other political figures often aim to sway public opinion on specific policies or general perceptions of the government and legitimacy (Dukalskis and Gerschewski 2017; Mattingly and Yao 2022; Pan, Shao and Xu 2021), shape public behavior, whether it is to obtain political compliance or mobilize the masses (Huang 2015; Perry, Ekiert and Yan 2020), set the agenda (Scheufele 2000), or divert public attention (King, Pan and Roberts 2017). In other words, even with highly effective censorship, the regime has incentives to produce and disseminate information to influence the available content mix, aiming to proactively direct public attention, shape preferences, and guide behaviors.

Finally, controlling or influencing the algorithms used by social media platforms to recommend and rank content cannot address these challenges (Bolsover and Howard 2019). If the same state-produced content is algorithmically promoted to all users, many will not engage with it, choosing instead to bypass it by swiping past or reducing their time on the platform to seek more appealing content elsewhere. The diversification and proliferation of content means that it is impossible to compel users to consume the same content, even with algorithmic control.

## 2.2 A Decentralized Propaganda Model

To engage a fragmented audience distributed across online spaces catering to specialized interests, the regime can decentralize propaganda production, dramatically expanding the number of propaganda content producers. Instead of a handful, or even a few hundred, professional, state-controlled media outlets, thousands or tens of thousands of media professionals and non-professionals are tasked with creating content. While we expect those in power to set guidelines on content, producers are given a great deal of autonomy in what they can produce. The vast number of producers, each with their own knowledge, expertise, and interests, produces large quantities of content, including content that meets varied audience interests and needs.

Decentralization of propaganda was observed in the era of traditional media but to a much lesser extent. A decentralized system outperforms a centralized system in producing diverse, responsive, and persuasive propaganda content to reach a larger audience, thanks to the autonomy granted to numerous producers. But principal-agent problems, caused by divergent interests and information asymmetry between managers (principals) and producers (agents), are inherent in decentralized systems and can hinder propaganda efforts. In the traditional media era, the high costs of content production meant that decentralizing production inevitably entailed the commercialization or marketization of media outlets to incentivize producers (Stockmann 2013). Yet, market competition creates divergent interests between principals and agents, along with difficulties in monitoring, thereby reducing the amount of propaganda produced, even among government-owned outlets (Gehlbach and Sonin 2014; Qin, Strömberg and Wu 2018). The tradeoff between incentivizing content creation and overseeing it likely limited the adoption of decentralized propaganda production.

Social media enables decentralized propaganda because it (a) lowers the entry costs of account and content creation, (b) provides incentives for content creation, and (c) reduces the cost of monitoring at scale. In other words, social media can help mitigate the tradeoff between incentivizing and monitoring content creation, allowing the government to decentralize propaganda production at scale.

### 2.2.1 Cost of Entry

Social media lowers the entry costs of account and content creation, allowing everyone, including those who are not media professionals, to easily create their own accounts and become content creators. In the traditional media era, it was costly to set up a media channel, and at most, each propaganda producer would have one TV station, one radio station, and a limited number of newspapers. In the social media era, creating an account or handle on social media is usually free, and a single propaganda producer can easily create and manage dozens of accounts on one or more social media platforms. In the traditional media era, it was also costly to create content, especially in visual formats, requiring trained professionals and specialized equipment. In contrast, technological advancements such as smartphones and affordable, high-quality digital cameras, as well as the availability of free or low-cost editing software and applications mean that editing, uploading and sharing of content in multiple modalities (text, audio, visual) is easy to do. Furthermore, there are many resources that new content creators can draw on (e.g., online tutorials) to quickly learn how to create content on social media platforms, and the proliferation of digital data means that there is an ample supply of material for new content creators to use as inspiration. These tools and resources have significantly lowered the financial and technological barriers to content creation, making it accessible to a much larger population. This leads to the first set of observable implications of a decentralized propaganda model:

1a **Number of producers:** A decentralized model entails a large number of producers.

1b **Type of producers:** A decentralized model includes producers who are media professionals and non-professionals.

### 2.2.2 Incentives

The phenomenon of gaining likes, shares, and other forms of audience engagement on social media can be intrinsically motivating for some people as people seek to fulfill various needs and gratifications when using social media (Alhabash and Ma 2017; Katz, Blumler and Gurevitch 1973; Whiting and Williams 2013).<sup>4</sup> In the context of propaganda production, the pursuit of audience

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<sup>4</sup>By intrinsically motivating, we mean appealing even if engagement does not lead to financial gain or opportunities for self-presentation. For example, more likes and reshares may shape a sense of social approval, which can fulfill

engagement can serve as an incentive for some creators to make original content appealing to audiences. Furthermore, the significantly reduced cost of content production removes the need for marketization as an incentive mechanism for content creation. The absence of commercial interests among agents means their interests align more closely with those of the principal.

### 2.2.3 Monitoring

While decentralization in general may lead to a divergence between the interests of agents and their principals (Landry 2008), social media facilitates monitoring in ways often infeasible through traditional decentralization methods. The number of posts that are made as well as quantified metrics such as views, likes, reposts, and comments are publicly visible on social media (Boyd and Crawford 2012; Lu and Pan 2021). Consequently, principals can readily observe the volume of content produced by their agents' social media accounts, assess the success of these accounts in attracting audience attention, and make direct comparisons across different agents' accounts. This means principals can incentivize a large number of producers with limited resources by punishing accounts that are not producing content (shirking) and by organizing low-cost competitions where agents are evaluated on the basis of publicly visible social media engagement metrics. Finally, since relatively few pieces of content gain high levels of attention, if the content that gains attention is deemed objectionable by the principal, the offensive content is easily identified and the agent producing it punished.<sup>5</sup> Punishing viral content considered inappropriate by the regime acts as a strong deterrent, further compelling other producers to align their content with propaganda guidelines.

Altogether, these factors mean that a decentralized propaganda model not only produces a large volume of diverse content but what is produced differs from what non-regime affiliated accounts

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needs for social relatedness (Gangadharbatla 2008)

<sup>5</sup>For example, a local state media account on Douyin, Hefei Financial Channel, falsely reported a super-spreader event during the COVID pandemic, which went viral on Chinese social media. The video contained fake photos and was quickly identified as false by netizens (for more details, see [https://www.sohu.com/a/382050861\\_120214184](https://www.sohu.com/a/382050861_120214184)). There are cases where those who operate state-affiliated accounts have been disciplined by the regime. For example, information disclosed by the Anhui Provincial Cyberspace Administration indicates that the operators of social media accounts, including Huainan Micro XX, Hefei Traffic XX, Hongye Firefighting XX, and Anhui XXX, among other non-state accounts, were “summoned and educated” for spreading inappropriate content. Although the full names of these accounts were not made public, they are clearly state-affiliated account, as only registered state accounts are allowed to use such administrative division names in their social media handles (for more details, see <http://www.ahjgbzw.gov.cn/content/detail/64c8460b7f8b9a8c188b4567.html> and <https://hqtime.huanqiu.com/article/4EVhZnXIojg>).

would produce. Whereas non-regime affiliated accounts may strongly prioritize entertainment and sensational content to maximize views, we expect regime-affiliated producers to rely on such traffic generating content to a lesser extent and to prioritize content designed to convince the public to think about the regime in some positive way, e.g., idealized images of the top leader, government achievements, national and military strength, responsible government policies and programs, and a good society. This leads to the second set of observable implications:

2a **Content volume:** A decentralized model consistently produces a large volume of content.

2b **Content diversity:** A decentralized model produces diverse content.

2c **Content composition:** A decentralized model produces content that is of a different content mix than what would be produced solely by non-regime-affiliated accounts.

#### **2.2.4 Implications for content flow and engagement**

The decentralized propaganda model has implications for how information flows between government-affiliated producers. Information dissemination in a traditional broadcast framework is typically uni-directional: a small number of central media outlets produce the best content, which is then copied by peripheral state media. Decentralization on social media changes this pattern. Instead of solely broadcasting content from a small number of central propaganda outlets, the interconnectivity of social media allows accounts to easily share content among themselves. Central accounts can source content from peripheral accounts, while peripheral accounts can use materials from central ones or other peripheral accounts. Regime-affiliated accounts may also incorporate materials from non-regime content producers. Thus, a decentralized propaganda model on social media implies that content flows not only from the center to the periphery but also the other way around.

3 **Content Flows:** In a decentralized model, we expect that content flows in both central-peripheral and peripheral-central directions.

This multidirectional content flow enables the regime to engage a broader audience than would be possible through a unidirectional flow from central propaganda accounts to peripheral users. Though not every piece of content, or even the majority, gains widespread attention, a decentralized



model achieves more audience engagement. This occurs for two reasons. First, a larger and more diverse pool of producers increases the chances of content receiving broader attention. Second, and perhaps more importantly, the most successful pieces can be redistributed by other accounts, thereby amplifying the breadth and depth of information cascades to reach even larger audiences. This leads to the final observable implication:

- 4 **Engagement:** In a decentralized model, we expect that content copied by central accounts from peripheral accounts to have higher audience engagement than content originating from central accounts.

It is important to acknowledge that the ability to employ the decentralized model is bound by the availability of human resources and mobilization power as well as a centralized capacity for control. A decentralized propaganda model requires the availability of individuals that the state can deploy for such assignments, which can include government workers, affiliated individuals (e.g., nationalistic youth, party members), and perhaps commercial actors who are sympathetic to the cause (Ong and Cabañes 2019; Woolley 2022). Such a model also requires there to be a centralized authority that is directing the actions of agents, and capable of providing rewards or sanctions based on observing the behavior of agents.

## 2.3 Studying Propaganda in China

This paper focuses on whether China under the rule of the CCP has adopted a decentralized propaganda system for two main reasons. First, the CCP meets the scope conditions of where we may expect to observe a decentralized propaganda model. China under the CCP is a high capacity authoritarian regime that has for decades exhibited a high level of control over traditional, broadcast media (Brady 2009; Qin, Strömberg and Wu 2018; Stockmann 2013), as well as power to mobilize regime insiders and the public more broadly (Kennedy and Chen 2018; Looney 2020).

Second, the CCP has demonstrated its interest in controlling information on digital media instead of imposing a complete ban of social media. China has implemented, large-scale, multi-faceted censorship with strategies ranging from website filtering to content removal (Bamman, O'Connor and Smith 2012; Chen and Yang 2019; Gallagher and Miller 2021; King, Pan and

Roberts 2013, 2014; Roberts 2018). China bans many US-based digital media platforms—e.g., Facebook, Instagram, YouTube—through the so-called “Great Firewall,” but has allowed Chinese social media platforms to grow and serve the large and lucrative domestic Chinese market (Pan 2017).

In past ten years, the CCP has adopted the strategy of “media convergence” (Repnikova and Fang 2019).<sup>6</sup> While media convergence has many aspects, one goal is for the CCP to occupy digital spaces.<sup>7</sup> The key social media platforms for media convergence have evolved from “Two Wei” (两微), which refers to WeChat and Weibo, to “Two Wei and One APP” (两微一端, which expanded beyond WeChat and Weibo to include government applications, to finally “Two Wei, One APP, and One Dou” (两微一端一抖, which includes Douyin. The CCP has made substantial headway in establishing its presence on Chinese social media. As of December 2022, all provinces in China have created their Weibo accounts, and more than 145,000 Weibo accounts are verified as government-affiliated accounts on Weibo (CNNIC 2023). Governments at all levels have been increasing their presence on new forms of social media and adapting their media strategies for state propaganda.

### 3 Data and Methods

To evaluate whether we observe a decentralized propaganda model in practice, we examine the digital presence of the CCP on the short-form video platform Douyin, the Chinese branding for TikTok, which is also owned by Bytedance. We focus on Douyin because the platform has been hugely successful in capturing the Chinese social media market, reaching over 750 million month active users as 2023 and growing more quickly than any other Chinese or global social media

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<sup>6</sup>In November 2013, the Third Plenary Session of the 18th Central Committee of the Chinese Communist Party proposed the promotion of the integrated development of traditional and new media, indicating that “media convergence” had become a consensus of the entire Party. In August 2014, Xi emphasized in “Guidelines on Promoting the Convergence and Development of Traditional and New Media” (关于推动传统媒体和新兴媒体融合发展的指导意见) that media convergence should undergo an “in-depth convergence between traditional and new media in aspects like content, channels, platforms, operations, and management,” and developing new forms of mainstream media and media groups with “diverse forms, advanced methods, and competence.” ([https://www.cma.gov.cn/2011xzt/2015zt/20150827/2015082703/201508/t20150827\\_291684.html](https://www.cma.gov.cn/2011xzt/2015zt/20150827/2015082703/201508/t20150827_291684.html)).

<sup>7</sup>See, for example, Grasp the trend of media transformation and actively occupy emerging public opinion positions—Study and implement General Secretary Xi Jinping’s important expositions on the development strategy of emerging media.[http://www.xinhuanet.com/politics/2016-06/14/c\\_1119039250.htm](http://www.xinhuanet.com/politics/2016-06/14/c_1119039250.htm)

platform in recent years. In contrast to traditional social media platforms such as Weibo, the video-based format of Douyin draws users from lower-tier, non-coastal cities. The average user spends 73.6 minutes on Douyin each day, and Douyin serves as a primary source of information for many ordinary Chinese people.<sup>8</sup> In addition, Douyin has worked closely with the CCP, including providing training on how to build audience for government-controlled accounts, and has been emphasized as a key channel that the CCP must dominate by China's leader Xi Jinping.<sup>9</sup> Together, this means Douyin encompasses a huge audience base and is a platform where the CCP is active.

Similar to social-network-based platforms such as Weibo and Facebook, Douyin features highly diverse content and offers audiences a wide range of choices; consequently, the government faces the challenge of competing for attention (Lu and Pan 2021, 2022; King, Pan and Roberts 2017; Roberts 2018). Douyin differs from older social media platforms in its algorithm-driven approach, where content delivery does not rely on users building their own social networks. On Douyin, users receive content recommendations before establishing connections with other accounts. However, this distinction is one of degree rather than kind, as feed ranking algorithms also play a large role on social media platforms like WeChat and Facebook, which initially emerged as social networks (Guess et al. 2023).

## Data Collection

Chinese government reports claim there were 25,313 regime-affiliated accounts on Douyin as of June 2020 (CNNIC 2020). However, there are no lists documenting these accounts. To identify accounts affiliated with the Chinese government or the CCP, we start with 2,478 known regime-affiliated accounts whose videos were highlighted in Douyin's Trending Videos in 2020 (Lu and Pan 2022). Then, we identify all accounts these 2,478 accounts follow.<sup>10</sup> This resulted in 114,689 unique accounts, among which 22,070 accounts were verified enterprise accounts, of

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<sup>8</sup>See [https://m.tech.china.com/tech/article/20210825/082021\\_859739.html](https://m.tech.china.com/tech/article/20210825/082021_859739.html) and <https://min.news/en/tech/8292efb21d908cc0c80e7379ace164db.htm>.

<sup>9</sup>See [http://www.cac.gov.cn/2019-12/03/c\\_1576907933632994.htm](http://www.cac.gov.cn/2019-12/03/c_1576907933632994.htm).

<sup>10</sup>This was done in 2021. We focus on following networks instead of follower networks because regime-affiliated content creators are more likely to follow one another, whereas their follower networks might be extremely large and diverse.

which regime-affiliated accounts are a subset.<sup>11</sup> Six trained, native Chinese speakers manually examined the detailed verification information in each account’s metadata to identify 7,879 new regime-affiliated accounts from the 22,070 accounts. Then, we repeat this process, collecting the verification status of all accounts followed by the 7,879 regime-affiliated accounts and identifying additional new regime-affiliated accounts. From this process, we identify a total of 21,408 regime-affiliated accounts, which is close to the number reported in the 2020 government report.<sup>12</sup>

We then collect all videos from the timeline of the 21,408 accounts made between June 1, 2020 and June 1, 2021. We exclude accounts that did not post any videos during this time period, resulting 5.17 million videos from 19,042 accounts.

To empirically assess whether there is evidence of decentralized propaganda model on Douyin, we a) examine the characteristics of content producers by analyzing account-level meta-data; b) assess the originality of content by conducting video similarity analysis; c) compare the categories of content produced by regime-affiliated accounts; d) analyze the direction of information flow, and e) measure the level of user engagement.

## **Analyzing Characteristics of Propaganda Producers**

We focus on two main characteristic of propaganda producers: a) central-peripheral position, and b) media professionalization. In a decentralized model, we expect peripheral accounts to play an important role in content production, and we expect content to be produced by media professionals and non-professionals.

We use central versus local administrative level as proxies for the central-peripheral relations in China. We identify the administrative level of an account by manually examining the verification details in the account metadata. We classify whether an account is affiliated with: a) central level; b) province level; c) prefecture/city level; or d) county level entity. We consider central-level accounts to occupy central positions, while provincial, prefecture/city, and county level accounts are deemed peripheral. There are three reasons for this. First, within a bureaucratic hierarchy,

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<sup>11</sup>We only include verified enterprise accounts in our analysis because official, regime-affiliated accounts all have enterprise verification. While there may be regime-affiliated accounts without enterprise verification, we err on the side of precision and only include verified accounts.

<sup>12</sup>Since the report is from 2020 and our account identification procedure was conducted in 2021, we do not expect the numbers to match perfectly.

central-level departments naturally serve as principals at the center, whereas their local branches act as agents on the periphery. Second, certain central-level entities, such as media outlets, presses, and propaganda departments, have traditionally been at the core of propaganda efforts in China. In the broadcast era, content from the central level was often syndicated by lower levels. Third, central-level bureaucracies in China are generally better resourced than their lower-level counterparts, which means they have more funds to hire personnel and produce content.

We consider accounts to be run by media professionals if the account is affiliated with any state-controlled media outlets or the CCP propaganda department and its local branches because these organizations have traditionally be tasked with propaganda work in China (Brady 2009; Stockmann 2013). We identify the functional affiliation of an account by manually examining the verification details in the account metadata. We classify whether an account is affiliated with: a) state media, such as state-owned newspapers, television stations and programs, radios, websites, social media accounts, and state-controlled media organizations; b) propaganda departments, which includes propaganda bureaus, government information/news/multimedia centers, and Cyberspace Administration of China (CAC); c) government administrative offices, e.g., the CCP Municipal Committee Office in Baiyin Municipality (中共白银市委办公室); d) security apparatus, such as police, military, court, prison, or affiliated units such as the local compulsory drug rehabilitation center; e) firefighters, including the firefighting system and emergency management system (应急管理系统); f) local Communist Youth League; g) travel / broadcast departments, including the tourism bureau, scenery management center, the state administration of radio, film and television, departments of Press and Publication; h) other department, such as the Political and Legal Affairs Commission, local Centers for Disease Control and Prevention agencies, and local departments of market supervision; and i) other accounts, which are non-departmental organizations such as local associations for science and technology and Women’s Federations. We excluded accounts in the “other” from our analysis.<sup>13</sup> As a result, our final dataset consists of 5.14 million videos from 18,684 accounts, which is the basis for all analyses in this paper.

Table 1 shows that among the 18,684 regime-affiliated accounts, 9,509 (51%) are county-level

<sup>13</sup>We excluded these account to err on the side of conservatism since the strength of ties between the regime and accounts in the other category is not always clear or strong.

accounts, 6,158 (33%) are city-level, 2,473 (13%) are provincial-level, and 544 (3%) are central-level.<sup>14</sup> Accounts average 275 videos in a year.

TABLE 1. REGIME-AFFILIATED ACCOUNTS AND VIDEOS BY ADMINISTRATIVE LEVEL

Administrative level	Total accounts	Total videos
Central-level Accounts	544	305,371
Province-level Accounts	2,473	1,327,555
City-level Accounts	6,158	1,886,783
County-level Accounts	9,509	1,621,812
Total	18,684	5,141,521

## Video Similarity Analysis

We expect a decentralized propaganda model to produce diverse and original content. To evaluate this, we assess the similarity of videos produced by accounts at different levels of the government. To reduce computational costs, we start by sampling five days in each month. For each sampled day, we include data from three days before and three days after. This results in a total of 244 days considered for this analysis. Within each day, we compare videos posted by central-level accounts against those posted by all local-level accounts (e.g., central-created video A with province-created video A, central-created video A with city-created video B, central-created video A with county-created video C) and videos posted at the central level are compared with all other central-level videos (e.g., central-created video A with central-created video B).

Comparing videos can be a challenging task as videos include multiple modalities (audio, visual, and text), which require more time and effort to annotate (Nyhuis et al. 2021). Despite a rising interest in studying videos as data in social science research (Dietrich and Juelich 2018; Kang et al. 2020; Lu and Pan 2022; Rittmann, Ringwald and Nyhuis 2020), little work focuses on video-based similarity comparison. We apply a CNN-based frame-to-frame video-similarity learning framework, ViSiL (Kordopatis-Zilos et al. 2019), to calculate the similarity between each two videos. Compared to other state-of-the-art frameworks that compare videos frame-by-frame, ViSiL

<sup>14</sup>For reference, there are 34 provincial-level administrative units in China, 333 city-level units, and 2,844 county-level units. This means that on average, each administrative region has multiple Douyin accounts.

not only considers the spatial (intra-frame) information of the video but also considers the temporal (inter-frame) information to calculate the similarity of two videos. We applied the PyTorch implementation of ViSiL on each central-local video pair or central-central video pair to facilitate the video-to-video comparison. On each sampled day, we compare an average of 2,801,805 central-county video pairs, 3,704,207 central-city video pairs, 2,463,466 central-province video pairs, and 690,241 central-central video pairs.

ViSiL generates a similarity score from 0 to 1 for each video pair. We set our similarity threshold to 0.75. This means if the similarity score is 0.75 or above, we consider the two videos to be a match (see Appendix A2 for example video comparisons). We derived this threshold through human validation of 1,000 video pairs. This threshold produced the highest accuracy (0.85) and highest F1 score (0.70). Using the similarity score for each local video for each day, we calculate the percentage of videos in province, city, and county-level accounts that match at least one video from a central-level account on each sampled day, as well as the percentage of central-level videos that are copied from the same level.

## Categories of Content

While we expect diversity and originality in content, the incentives and monitoring mechanisms suggest that the output of a decentralized propaganda model will likely differ from that of non-regime-affiliated accounts. To assess whether this is the case, we conduct human-based video content analysis on a random sample of 18,571 videos produced by regime-affiliated accounts at different levels of the government, selected through stratified sampling by date of creation. Five trained native Chinese speakers watched each video and placed it into six categories with 14 subcategories. We conducted three rounds of training for the coders, achieving inter-coder reliability of 74%.

As shown in Table 2, the categories are: 1) party-line propaganda, which includes content related to CCP ideology and central-level CCP leaders; 2) nationalism; 3) moral society, which focuses on the positivity in people’s daily lives and punishment of immoral behaviors; 4) government announcements and guidance; 5) entertainment and sensational content; and 6) a residual category of other content (for detailed coding rules, see Appendix Section A1). Our definition of

TABLE 2. CONTENT CATEGORIES AND EXAMPLES

Category	Example video titles
1. Party-line	Socialism and revolutionary culture Xi Jinping confers flag to China’s police force and speaks at the ceremony
2. Nationalism	War of Chinese people’s resistance against Japanese aggression
3. Moral society	Respect! The bus drivers suffered a heart attack but stopped the bus before falling into a coma! 14-year-old boy donates his bone marrow to save his father!
4. Announcements	Pensions for retirees rose by 4.5%! Notice! Power cuts will happen in the following places in Xuanwei! Please inform others
5. Entertainment	Disco dance of an old man in a Hebei park Who wins? Rat vs. Squirrel
6. Other	U.S. study: New coronavirus may have mutated to make humans more susceptible to infection

propaganda encompasses the first three categories as they all relate to areas where the CCP may want to influence public attitudes, knowledge, and behaviors. Content in the announcement category may or may not be propaganda. For example, announcement could entail image building by the local governments, which would make it propaganda, but announcements may also be purely informational. Given this ambiguity, we err on the side of conservatism and do not consider announcements to be propaganda. Finally, content in the entertainment category is unrelated to any aspects of social and political life. Entertainment content may be intended to attract viewers, but that does not fall under the definition of propaganda.<sup>15</sup>

We also compare the variation in content mix across these six categories for 8,028 trending videos made by regime-affiliated and non-regime-affiliated accounts posted between June 1 to June 17, 2020. This timeframe is chosen because data of trending videos from non-regime accounts are only available during this period. Trending videos are identified by their inclusion on the Douyin Trending Billboard, as highlighted by the Douyin platform itself. (Lu and Pan 2022).

<sup>15</sup>The entertainment category includes negative sensational content, which we also do not consider to be propaganda since most events either do not pertain to the government or reflect negatively on it.



## Content Flows

We expect that in the decentralized model, content not only flows from the center to the periphery but also from the periphery to the center. To identify content flows between central and local accounts, we utilize the previously mentioned video similarity analysis and the posting times of the videos, as the sequence of posting indicates the original source of the videos. We define central-level videos sourced from lower levels as those central-level videos that are highly similar to local-level videos where the local-level video was posted prior to the central-level video. In all other cases, we consider the central-level video to be the source.<sup>16</sup>

## Audience Engagement

Lastly, to determine how a decentralized propaganda model reaches audiences, we analyze the number of likes, comments, and reshares of videos. Specifically, we compare user engagement with video originating from central-level accounts to the engagement with central-level videos that are copied from lower-levels. We expect the latter, videos originating from local-level accounts but copied by central-level accounts, will have better user engagement. In addition, we merge the hand-labeled sample of 18,571 videos with the sample of videos for which we have similarity analysis. This allows us to identify a sample of propaganda-only content from central-level videos and compare user engagement between propaganda videos originating from local-level accounts and copied by central-level accounts and propaganda videos originating directly from central-level accounts.

## 4 Results

We present results pertaining to what types of regime-affiliated accounts are producing content on Douyin, the diversity of content produced, the categories of content produced, and audience engagement.

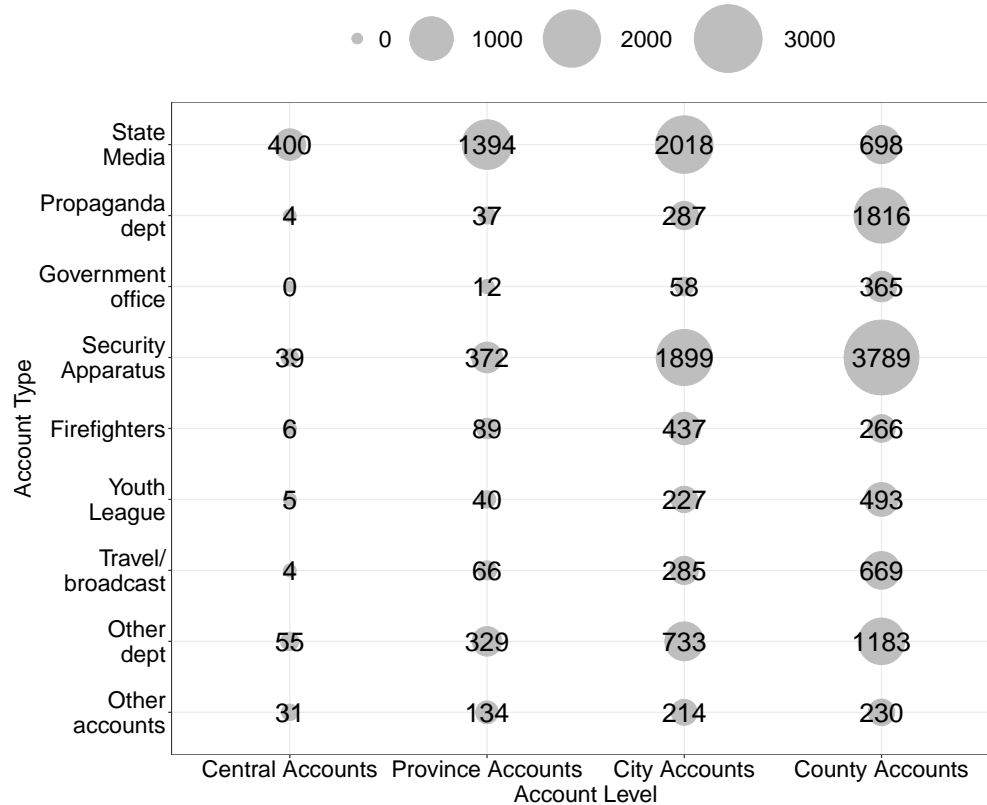
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<sup>16</sup>This includes central-level videos that bear no similarity to any local-level videos, as well as central-level videos that are similar to local-level videos, but where the central-level video was posted first. It may be possible that both the central-level and local-level videos are copied from non-regime affiliated accounts, or regime-affiliated accounts that were did not identify, which mean that our estimate may not capture that full extent of copying but is unlikely to affect the rate of central-local or local-central copying.

## Proliferation of Propaganda Producers

As expected, we observe a large number of accounts run by non-media professionals, alongside accounts from state-media outlets and propaganda departments. Figure 1 shows the breakdown of accounts by administrative level (x-axis) and functional bureaucracy (y-axis). A substantial

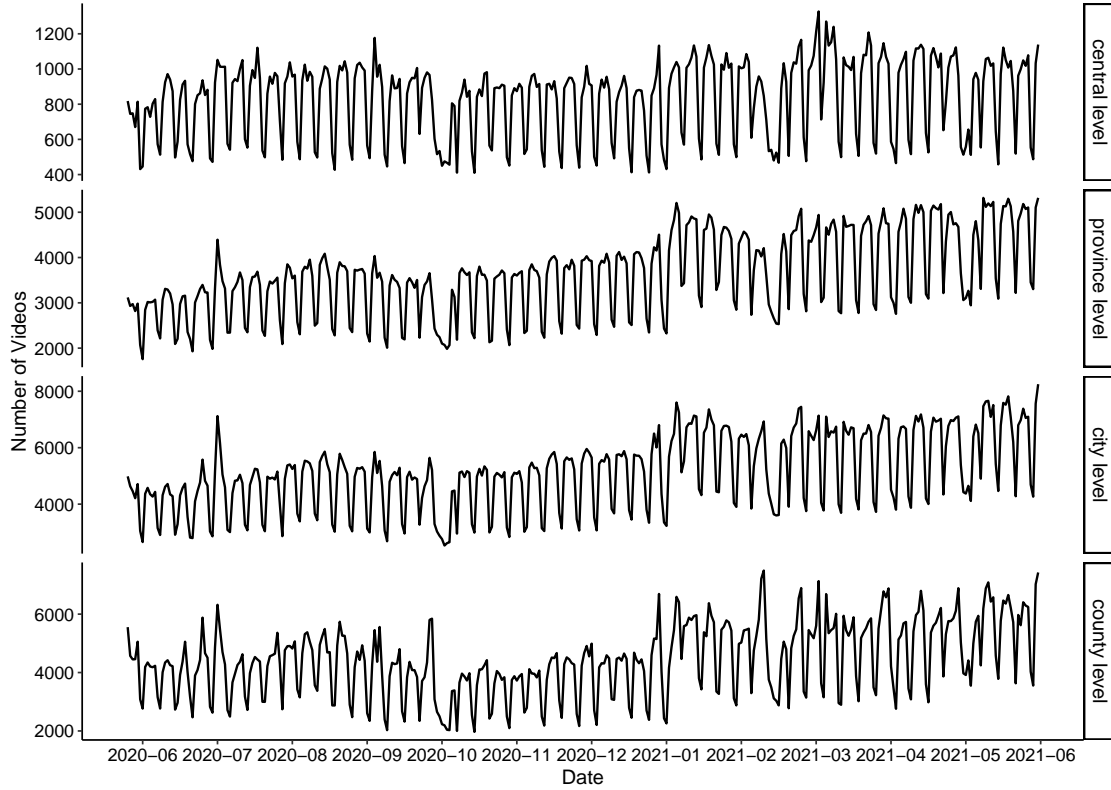
FIGURE 1. NUMBER OF ACCOUNTS BY LEVEL AND TYPE



number of accounts belong to state-controlled media outlets (4,510) and propaganda departments (2,144) at all levels of government. However, the functional bureaucracy with the largest presence on Douyin is the security apparatus with 6,099 accounts across different levels of government. In total, state media accounts for 24.1% of all accounts and propaganda department 11.5%.

Figure 2 shows that content production exhibits a weekly pattern, which is often observed among government-run social media accounts, namely that much more content is posted on weekdays than on weekends (Lu and Pan 2021). This suggests that although a large number of producers are steadily producing content, the activity for many is regarded as work, a sign of state-mobilized propaganda production rather than spontaneous content creation. Regime-affiliated accounts aver-

FIGURE 2. NUMBER OF VIDEOS



aged 11,544 videos per day during the first month of our data collection and 16,945 videos per day at the end of our data collection.

## Originality of Content

We find that the majority of videos from local-level governments are not similar to videos produced by central-level accounts. Figure 3 shows the proportion of videos from provincial-, city-, and county-level accounts that match central-level videos by day, for all sampled days. On average, only about 10% of local-level videos are copies of central-level videos. There is variation in the level of copying over time; however, even the day with the largest spikes in similarity—May 22, 2021 death of Yuan Longping—fewer than half of local-level of videos are copies of central-level videos (see Appendix A3.2 for detailed analysis of three dates where local-level copying of central level content is highest). In addition, a small proportion of central-level videos are copied by local levels. There are 59,619 central-level videos (31%) in our sampled days with local matches, while the remaining 133,622 (70%) are not copied by local-levels at all.

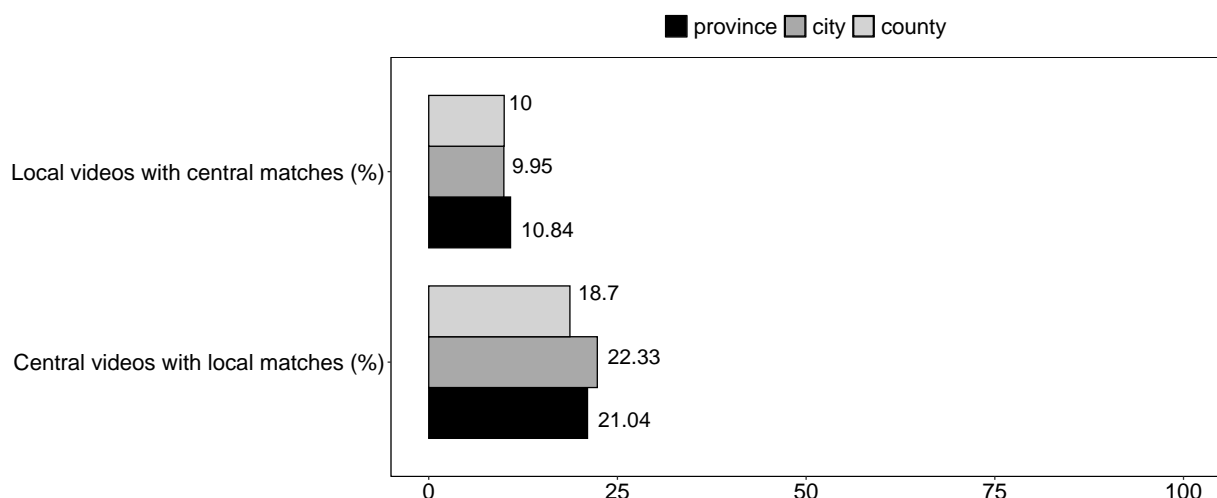


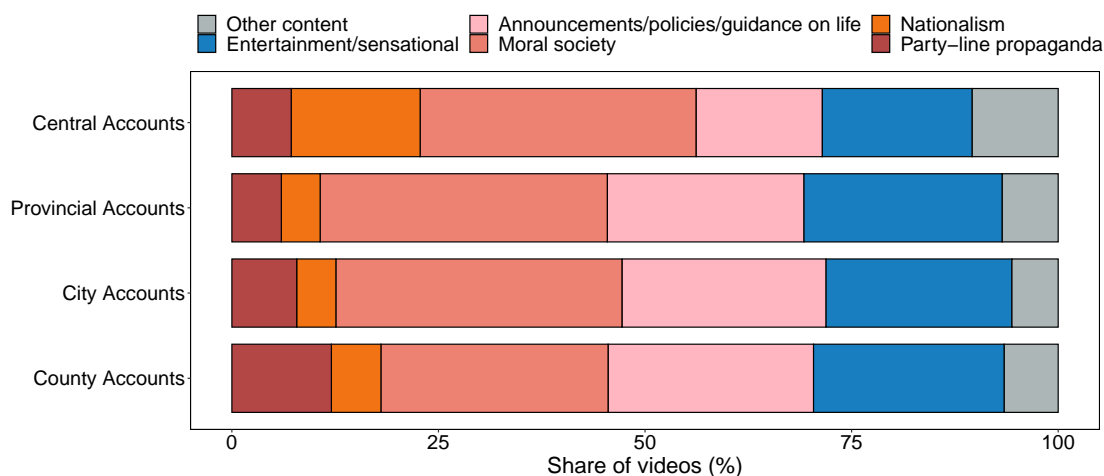
FIGURE 3. PROPORTION OF MATCHED VIDEOS BETWEEN CENTRAL AND LOCAL LEVELS

## Propaganda Content

Despite a low level of similarity among videos from regime-affiliated accounts, the vast majority of these videos pertain to propaganda, differing significantly from the content produced by non-regime-affiliated accounts.

Figure A8 shows the share of videos from each administrative level categorized by party-line propaganda (in dark red), nationalism (in orange), moral society (in dark pink), announcements and guidance on people's daily life (in light pink), entertainment (in blue), and other (gray). Nearly

FIGURE 4. CONTENT CATEGORIES BY ADMIN. LEVEL (JUNE 1, 2020–JUNE 1, 2021)

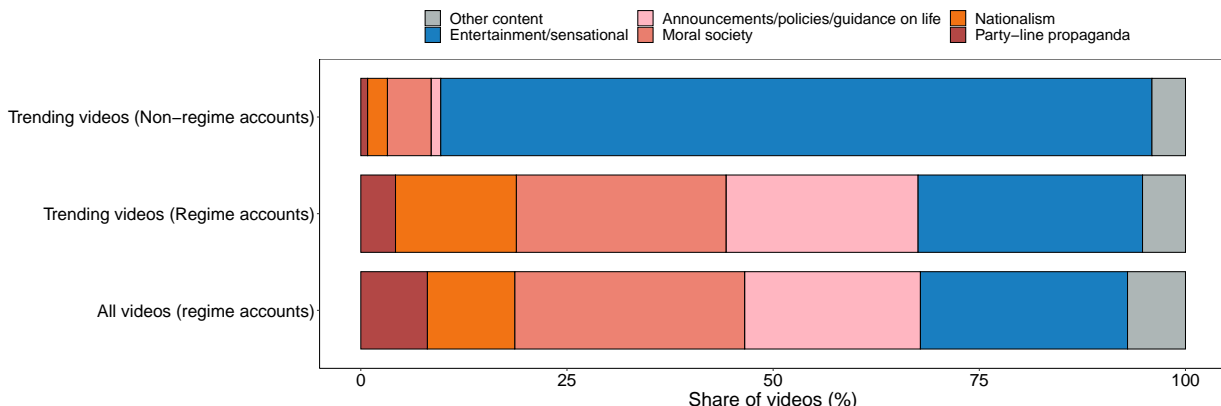


half (49%) of content at all levels pertain to party-line propaganda, nationalism, or moral society.

Content related to moral society occupies the largest share at all levels, with 33% among central-level accounts, 35% among province-level accounts, 35% among prefecture-level accounts and 27% among county-level accounts. If we included announcements as propaganda, propaganda content as a share of total content increased to 71%.

The mix of content from regime-affiliated accounts differs from what is observed more generally on Chinese social media. The top bar of Figure 5 shows that the distribution of content among trending videos created by non-regime accounts is dominated by traffic generation content (86.2%) with very little content related to nationalism (2.4%) and even less related to party-line propaganda (less than 1%). In the same time period, the mix of content from regime-affiliated accounts, both

FIGURE 5. COMPARISON OF CONTENT CATEGORIES (JUNE 1 - 17, 2020)



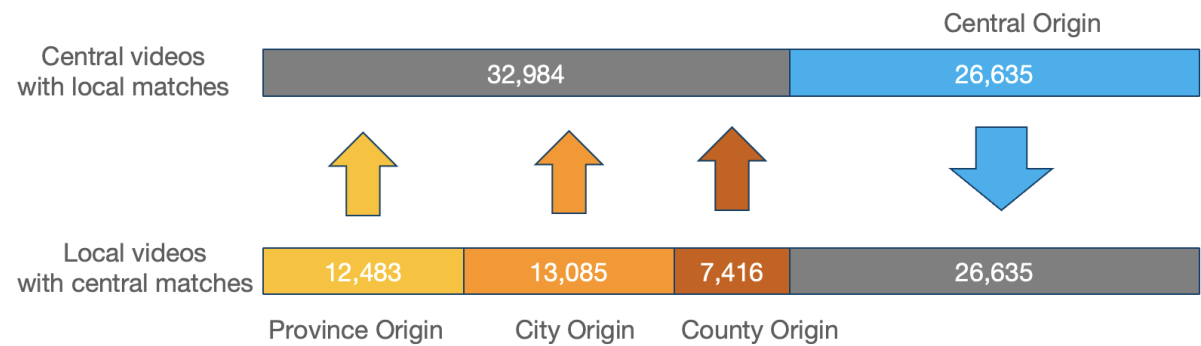
overall (bottom bar of Figure 5) and among trending videos (middle bar of Figure 5), show much larger shares of content related to propaganda.

One might be concerned that the rise of moral society content is a result of the COVID-19 pandemic, given we collected data from from June 1, 2020, to June 1, 2021. This is unlikely for several reasons. First, China effectively contained the pandemic from April 2020 to late 2021, thereby reducing public concern about the virus. Second, moral society content predates the pandemic and has been a major theme of Xi era propaganda since 2012, often described as “positive energy” (正能量, zheng nengliang) in official speeches (Chen and Wang 2019). Third, moral society content was not notably present in trending videos from non-regime accounts in June 2020, indicating it is not a direct response to the pandemic (Figure 5).

# Content Flow

Figure 6 shows that among central videos that have a match among local-level videos, the majority, 32,984 (55%), were first posted by local levels, especially by city- and provincial-level accounts. These results show that information is not only flowing from the top-down, but bottom-up as

FIGURE 6. MATCHED VIDEOS: ORIGINATING FROM CENTRAL-LEVEL VS. ORIGINATING FROM LOCAL-LEVEL



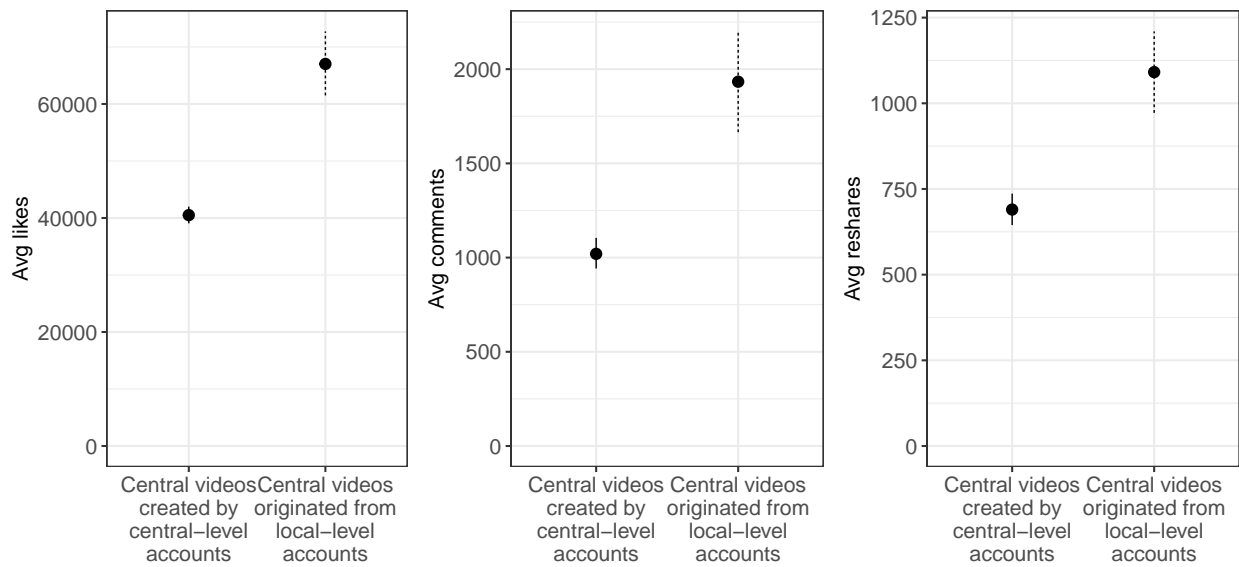
well. In fact, the bottom-up information flow, where central-level videos are of local origin, is the predominant pattern.

# Audience Engagement

When we look at user engagement between central-level videos of central origin and central-level videos of local origin, we find that engagement is higher for videos where the center has re-circulated content originating from local levels (see Figure 7). This engagement pattern is consistent with the understanding that a decentralized propaganda model, with a large number of accounts and diverse content, may increase audience engagement compared to a top-down, broadcast model driven by central accounts.

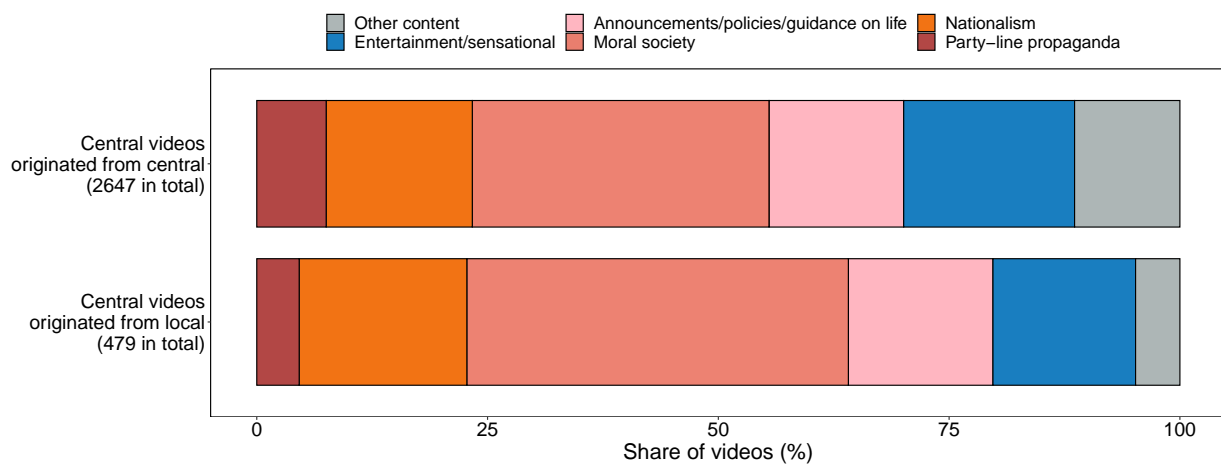
One may be concerned that the higher engagement with content copied by central accounts from local accounts is because these central accounts are selecting entertainment content rather than propaganda to boost engagement. To explore this possibility, we analyzed 4,126 videos produced by central accounts from within our random sample of 18,571 hand-labeled videos. Figure 8 reveals that the content central accounts copied from local accounts contains more propaganda, especially moral society content, than the original content from central accounts. This indicates that

FIGURE 7. AVERAGE VIDEO ENGAGEMENT BY CREATION



central accounts are not simply copying entertainment content from local levels, but propaganda content.

FIGURE 8. THE CATEGORIES OF SAMPLED VIDEOS: CENTRAL ORIGIN VS. CENTRAL VIDEOS ORIGINATED FROM LOCAL



Note: the 2,647 central videos originated from central accounts include both videos with local matches and videos without local matches.

## 5 Discussion

In this paper, we introduce the concept of a decentralized propaganda model, which is characterized by a larger number of producers, including professionals and non-professionals that produce original and diverse propaganda to reach fragmented digital audiences. We find evidence of a decentralized propaganda model in China on Douyin by identifying over twenty thousand regime-affiliated accounts, the majority of which are run by non-professionals, and analyzing millions of videos posted by these accounts. Regime-affiliated accounts actively produce a large volume of diverse content. Content produced by these regime-affiliated accounts is propaganda-oriented, with a substantial portion focusing on moral society, as well as ideological propaganda and idealizing of top leaders. Although these accounts do produce entertainment and sensational content that may be intended to generate audience traffic, we see a much smaller share of such content compared with the content produced by non-regime content creators on Douyin. In addition, content does not only flow in a top-down manner. Instead, local-level accounts produce a large number of original videos, and we see evidence of central accounts recirculating content from local levels. We observe higher levels of user engagement for central-level videos copied from the local level than central-level videos originating from the center, suggesting that the decentralized propaganda model may be more effective than a top-down content distribution system.

These findings have important implications for our understanding of government propaganda in the era of digital media. They challenge prevailing assumptions of how propaganda is created and disseminated and extend existing theories of how authoritarian governments engage in propaganda, such as through distraction or flooding (King, Pan and Roberts 2017; Roberts 2018), by affecting the algorithmic decision-making (Lu and Pan 2022), and by employing more captivating or attention-grabbing content strategies (Lu and Pan 2021; Mattingly and Yao 2022). This paper reveals that the Chinese government has adapted to digital media by altering the organizational structure, personnel, information flow, and content strategies of its propaganda system.

These findings also deepen our understanding of decentralization in authoritarian contexts. Decentralization within authoritarian regimes is well-documented (Heilmann and Perry 2020; Landry 2008; Xu 2011). Authoritarian regimes, including the CCP, have implemented decentralization



strategies across various domains. A notable example is the delegation of autonomy to local governments to foster economic growth and policy experimentation (Oi 1992; Maskin, Qian and Xu 2000; Montinola, Qian and Weingast 1995). However, decentralization poses significant challenges for regimes, such as moral hazard—ensuring that delegated agents exert effort and adhere to the regime’s objectives—and negative externalities, resulting from intense competition among agents leading to overlooked adverse outcomes. When a decentralization model is applied for economic growth, monitoring agents can be, and regimes often rely on proxies like GDP growth to gauge effort. In contrast, with social media, many effort-related metrics (e.g., number of posts, audience engagement) are publicly visible to both the principal and other users. Additionally, negative externalities, such as the proliferation of content that contradicts propaganda objectives, can be more easily monitored and addressed by the regime as needed.

Several limitations should be kept in mind when interpreting these results. First, the analysis relies on data predominantly from regime-affiliated accounts, supplemented by trending videos from non-regime-affiliated accounts over a brief period. The degree to which video content from regime-affiliated accounts varies from that of non-government accounts remains unclear. Future research should collect representative data on non-government accounts to address this concern. In addition, there are likely social media accounts affiliated with the regime (e.g., accounts co-opted by the regime or accounts managed by private companies acting as government contractors) that we have not identified due to the non-public nature of these relationships. This indicates that the extent of regime activity identified in this paper is likely an underestimate.

Second, social video platforms like Douyin have distinct features that set them apart from traditional media such as newspaper and TV programs, as well as from social network-based platforms like Weibo or WeChat, where text and still images are more pervasive. Some aspects of the new model we identify and describe in its paper may be specific to the video format. However, we anticipate that other facets of the decentralized propaganda model, e.g., non-professional personnel, a large volume of content, diverse content types, and multi-directional information flow, will be observable on other social media platforms, which the Chinese government also prioritizes.

Lastly, our focus is solely on China, and there is a question of whether a decentralized propaganda model exists in other political contexts. There is reason to believe that such models may be

found elsewhere. This new propaganda model does not necessitate government control over internet infrastructure, service providers, or content platforms; it primarily relies on the government's ability to mobilize and direct content creators. While this paper focuses on the presence of this model in China, we hope future research will investigate the presence of the key features of the decentralized propaganda model in other contexts, such as India's right-wing Hindu nationalism (Udupa 2019), political trolls in the Philippines (Ong and Cabañes 2019), and Russia's domestic online propaganda efforts (Sobolev 2019).

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# Appendix

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## A1 Video Categories

**Party-line:** This category includes three sub-categories of videos pertaining to 1) CCP ideology, 2) activities of central-level CCP leaders, and 3) videos related to performance legitimacy. Ideology includes content containing central government or CCP ideology such as videos describing “Marxism ideological mobilization,” “Socialism and revolutionary culture,” and “Core Socialist Values.” This category includes videos packaged as soft propaganda, for example a video titled “University teacher teaches the history of the Party: in emotional part, she burst into tears” (大学教师讲党史：讲到动情之处，她潸然泪下). Content focused on central-level CCP leaders portray these leaders in a positive light and documents their speeches and activities. For example, we include in this category, the video titled “Xi Jinping Xi confers flag to China’s police force and speaks at the ceremony” (习近平向中国人民警察队伍授旗并致训词). The last sub-category of performance legitimacy contains content related to macroeconomic performance and development, such as GDP growth, poverty alleviation, rural revitalization, construction projects at the central and local, and government meetings and routine activities. This content aligns with a prior literature on image building among Chinese officials as the country focused on economic performance (Cai 2004; Pan

2019). An example in this category is the video titled: “A year-on-year growth of 16.8%! 329.8 billion yuan was invested in transportation fixed assets in August” (同比增长16.8%! 8月份, 完成交通固定资产投资3298亿元。 ).

**Nationalism:** Nationalism, including nationalism propaganda, has received a great deal of attention in studies of Chinese politics (Schneider 2018; Mattingly and Yao 2022; Weiss 2014; Zhang, Liu and Wen 2018). Three sub-categories make up this category. The first covers videos that heightens in-group solidarity, such as videos memorializing the “War of Chinese People’s Resistance Against Japanese Aggression.” The second sub-category includes content describing the scientific or cultural major achievements at the national level, such as the launch of space stations, the exploration of cultural relics, and the innovations of military weapons. The third sub-category contains content that denigrates out-groups—people, governments, political systems—in another country or region who are portrayed as ineffective, corrupt, unstable, and polarized. For example, one such video is titled “Heartbroken! A 10-year-old girl broke down and cried after hearing the #Floyd incident: ‘I may die because of my skin color’.” (心碎! 美10岁女孩听到#弗洛伊德事件后崩溃大哭: “我可能会因为我的肤色而死” ).

**Moral society:** Moral society content focuses on the good in people’s daily lives and indirectly implies that the regime is responsible for producing such outcomes. This category contains three sub-categories that emphasize the good in people’s daily lives: 1) morality of officials and security personnel, 2) morality of ordinary people, and 3) punishment for immoral behaviors. The morality of officials / security personnel category includes content shows how Chinese government officials, police officers, firefighters, soldiers at different administrative levels are helping ordinary people and society as a whole. For example, the video “Zhongshan police cracked a big case involving 200 million!” (中山警方破获大案, 涉案金额2亿! ) shows the competence of the police in the Zhongshan City. Another video, “Under the hailstorm, the hug of the policeman is so warm” (漫天冰雹下, 警察蜀黍的怀抱好温暖), shows how kind and personable police officers are. The second sub-category focuses on interactions between ordinary people (rather than between representatives of the regime and the public), showing how ordinary people conform to social ethics, professional ethics, family virtues, and personal virtues, together contributing to a moral society. For example, the video “14-year-old boy donates his bone marrow to save his father!”

(14岁少年捐髓救父！) shows this dynamic within a family. The video, “Respect! The bus driver suffered a heart attack and stopped the bus before falling into a coma!” (致敬！公交司机突发心梗，昏迷前全力停车！), highlights everyday heroism.

**Announcements & Guidance:** This categories includes information provided by the government with relevance to people’s everyday lives, including government announcements, practices, policies, as well as suggestions for how people should go about their lives. This type of content includes videos publicizing beneficial local policies, for example, “Pensions for retirees rose by 4.5%!” (退休人员基本养老金涨4.5%！), as well as actions by the government that will have broad impact, e.g., “Notice! Power cuts will happen in the following places in Xuanwei! Please inform others” (注意！宣威这些地方即将停电！请互相转告). Finally, content in this category also includes knowledge and general advice, such as the video “Is regular consumption of MSG harmful to the body?” (经常食用味精会对身体有害吗？).

**Entertainment:** This category includes three sub-categories of videos: 1) entertainment content; 2) local advertising content; and 3) negative sensational content. Examples include videos such as “Disco dance of an old man in a Hebei park” (河北大爷公园蹦迪舞姿). Local advertising content includes content promoting local sights, foods, resources, or any local claims to fame. For example, the video “The taste of childhood in Dancheng” (丹城小时候的味道) shows how people are enjoying Dancheng street foods. The negative sensational content includes negative news or events that are appealing or threatening, such as “Five dead in a store fire accident in Luyi” (鹿邑一门店发生火灾致5人死亡).

**Other content:** Finally, we have a residual category that includes social news that are not negatively sensational nor entertaining, such as “U.S. study: New coronavirus may have mutated to make humans more susceptible to infection” (美研究：新冠病毒或已发生突变，使人类更容易受感染); or other videos such as commercial advertisements and lottery drawings.

## A2 Video similarity examples

FIGURE A1. ViSiL SIMILARITY SCORE BETWEEN VIDEOS: 0.98

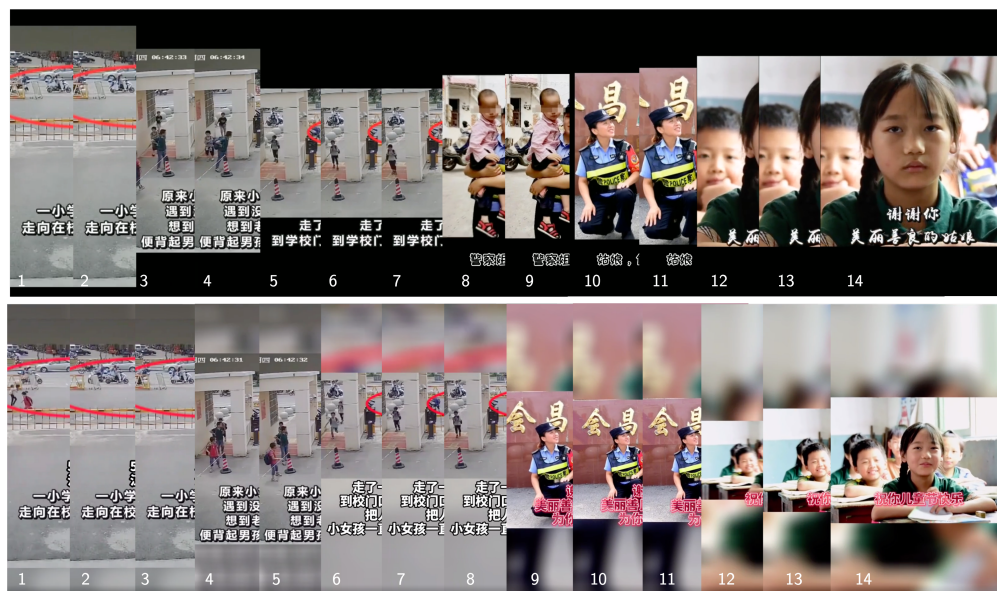
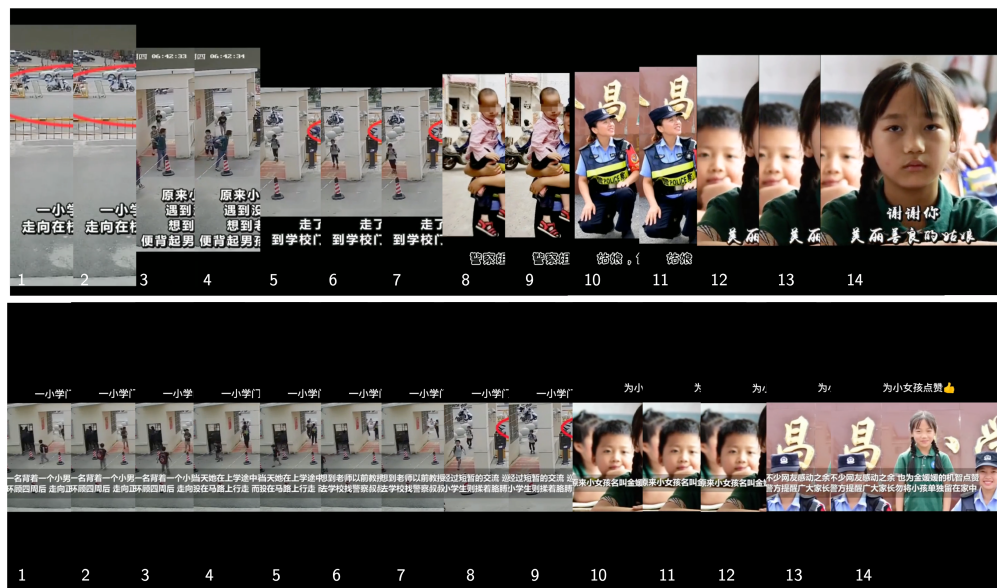


FIGURE A2. ViSiL SIMILARITY SCORE BETWEEN VIDEOS: 0.75



[illegible]

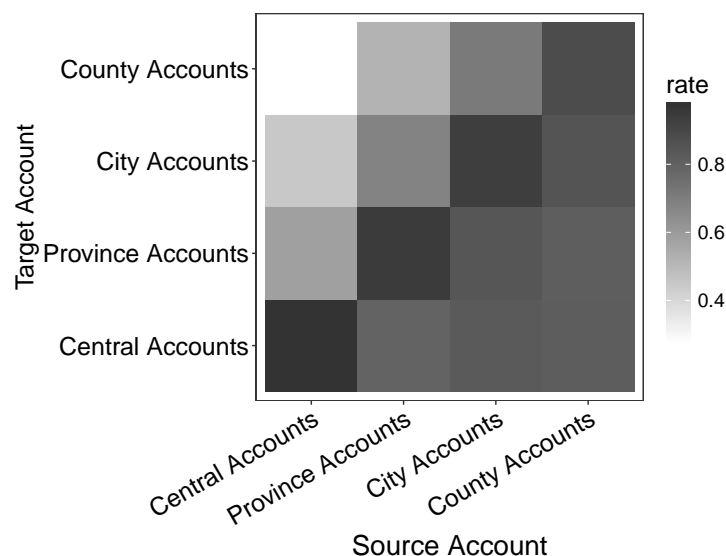


## A3 Additional Results

### A3.1 Regime-affiliated Accounts

Figure A5 shows the following relationships between accounts in our dataset by administrative level. The vertical axis indicates target accounts (who is followed) at each administrative level,

FIGURE A5. PROPORTION OF ACCOUNTS AT EACH LEVEL THAT FOLLOW ACCOUNTS AT DIFFERENT LEVELS



and the horizontal axis indicates source accounts (who is doing the following) at each level. The diagonal cells from the lower left corner to upper right corner reflect the proportion of accounts of that level followed by accounts at the same level within each administrative level (e.g., central accounts follow central accounts; local accounts follow local accounts). The off-diagonal cells indicate following relationships across administrative levels. For example, the cell (Central Accounts, Province Accounts) represents the proportion of central accounts that follow at least one province account.) The denser the following relationship, the darker the cell. The most dense following relationships fall along the diagonal. This suggests that government accounts are more likely to follow accounts at the same administrative level than across different levels and that accounts are not organized hierarchically (in an hierarchical organization, we would observe denser following relationships from lower administrative levels to upper administrative levels under a hierarchical structure—i.e., the bottom four cells would need to be darker than other cells).

### A3.2 Information Flow

Figure A6 shows the percentage of central videos that have local matches on each sampled day. Table A1 shows the total number of local-level videos entered in video similarity analysis and the percentage of local videos with central matches.

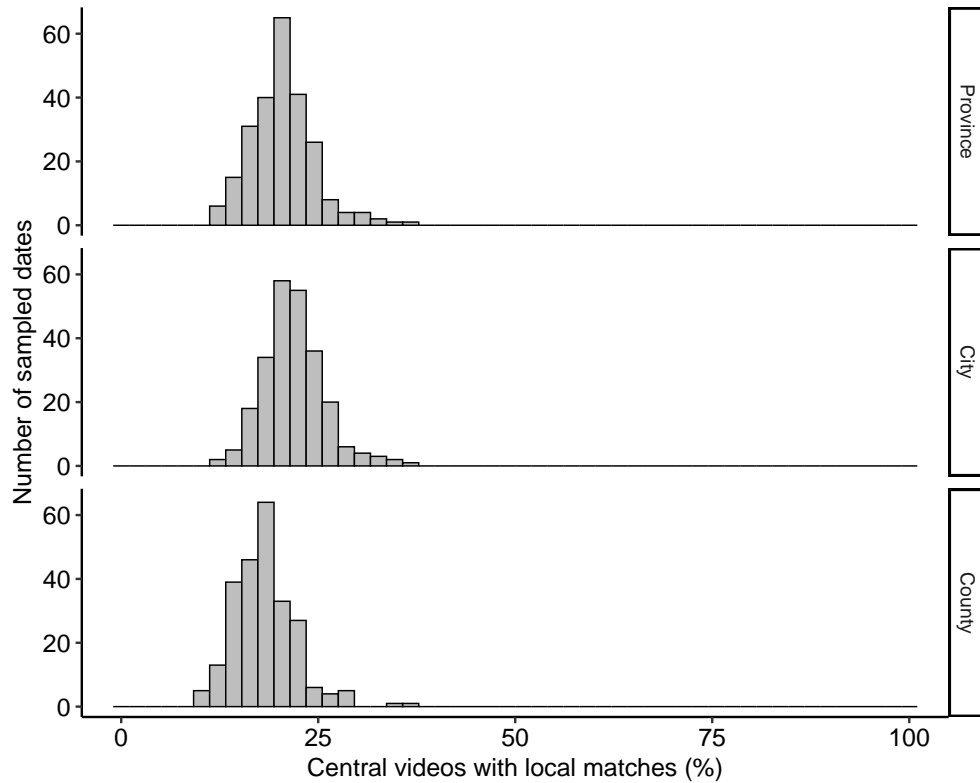


FIGURE A6. HISTOGRAM OF CENTRAL VIDEOS THAT ARE COPIED BY LOCAL-LEVEL ACCOUNTS

TABLE A1. PERCENTAGE OF LOCAL VIDEOS WITH SIMILAR CENTRAL VIDEO MATCHES

Local Admin Level	Number of videos	%Videos with central matches (0.75 threshold)
Province level	832,339	10.8%
City level	1,240,972	10.0%
County level	956,834	10.0%



To further show decentralized content creation, we examine the three dates where local-level copying of central level government is highest, as well as an additional date—April 29, 2021 when China’s Tianhe space station launched—when we might expect to see more top-down dissemination of content (see Table A2. For the Tianhe space station launch, we qualitatively analyzed all local-level videos to determine what proportion of video match central-level video, and for the other three dates, we watched the most copied central videos as well as a sample of local videos. Two of the dates—July 12, 2020 and May 22, 2021—are dates with emergent events, by which we mean events that were not organized by the CCP. For the other two dates, events are those spear-headed and potentially coordinated by the CCP.

TABLE A2. PERCENTAGE OF OF LOCAL VIDEOS MATCHED WITH CENTRAL VIDEOS BY EVENT

Event	Date	Attribute	Gov’t level	% of Matched videos
Multiple accidents	Jul 12, 2020	Emergent	Province	19.8%
			City	23.3%
			County	29.6%
Yuan Longping’s death	May 22, 2021	Emergent	Province	24.1%
			City	29.7%
			County	36.9%
Commendation conference for national response to Covid-19	Sep 8, 2020	CCP-led	Province	20.0%
			City	21.7%
			County	25.1%
Tianhe space station launched	April 29, 2021	CCP-led	Province	9.6%
			City	7.7%
			County	7.5%

On July 12, 2020, when nearly 30% of videos produced by county-level accounts match content produced by central-level accounts, several events occurred. These include a 5.1-magnitude earthquake in Tangshan, Hebei province, a flood in Hubei province, and a bus crash in Anshan, Guizhou province. Three out of the five videos released by the Douyin account of *People’s Daily* and three out of five videos released by the Douyin account of CCTV News were about these events. In addition to providing context about these events and showcasing government actions, some videos focus put a positive spin on these disasters. For example, the Huanqiu Douyin account released a video, which gained over 60,000 likes, entitled “A 20-year-old soldier is celebrating their birthday on the flood control embankment. You’ve been working so hard. Happy birthday!”

On May 22, 2021, when nearly 40% of videos produced by county-level accounts and over 30% of video produced by city-level accounts match content produced by central-level accounts. Yuan Longping, a Chinese agricultural economist known as the “Father of Hybrid Rice,” passed away at age 91. This emergent event triggered heavy coverage and mourning by state media and government departments at all levels. Two out of the three videos released by People’s Daily and four out of six videos released by CCTV News were about Yuan’s death on May 22. A few central-level videos were extensively copied by local-level accounts. For example, a video created by the *Global People* (环球人物), an account managed by People’s Daily, appeared 602 times in local-level accounts in our dataset.

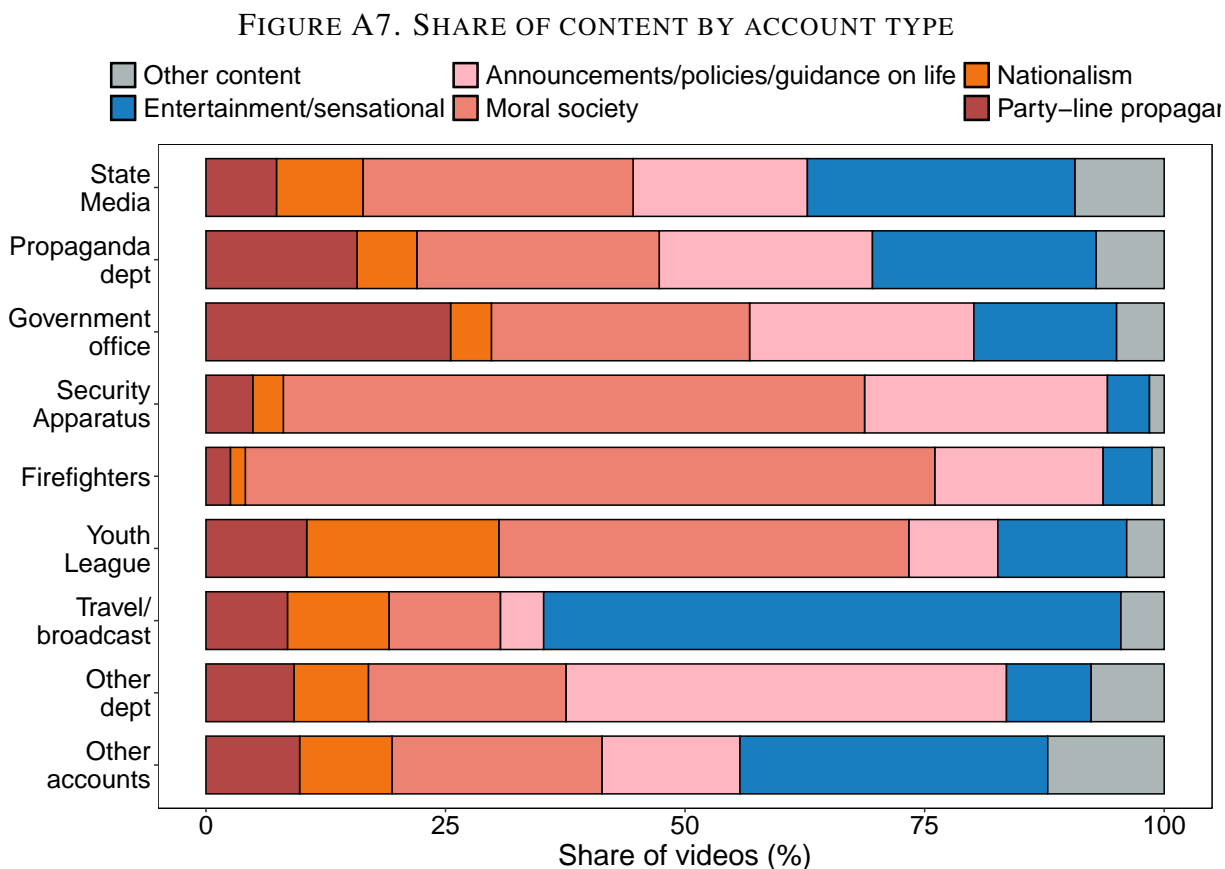
Turning to CCP-led events, on September 8, 2020, the Commendation Conference for China’s National Response to Covid-19 was held at the Great Hall of the People in Beijing. Xi Jinping awarded medals to medical experts such as Zhong Nanshan and Zhang Boli, and delivered a formal address. On this day, nine videos released by People’s Daily covered the event. When watching videos from local-level accounts, we found that some local accounts used clips, such as Xi awarding medals to the national heroes, taken from the central videos to create their own videos. However, other local accounts used original materials to praise and memorialize those who were recognized at the event. In total, only 22.4% of videos produced by local levels matches content produced by central-level account.

Finally, on April 29, 2021, China launched the core module of its Tianhe space station. This is a CCP-led, mega achievement highly covered by central state media, which we would expect to be copied by lower-level accounts in a traditional broadcast model. On April 29, three out of the four videos released by People’s Daily Douyin account and four out of the six videos released by CCTV News Douyin account were about the Tianhe launch. However, after our team of research assistants watched 17,887 videos produced by local-level accounts on this day, we only found 744 videos (4%) total reporting on this event. Among the 6,186 local-government accounts that posted propaganda content on April 29, only 577 accounts reported this event. This is striking because the Tianhe launch is a highly managed pseudo-event, meaning that it is planned and scripted by the regime, making it an event that is easily re-broadcast. In addition, compared with the central state media Douyin videos, most of which present live broadcasts of the launch, videos by local

accounts are more diverse. For example, one province-level state-media account, Sichuan Guancha (四川观察), managed by Sichuan Province Television, posts a video showing how a kindergarten girl wanted to give her lunch to the astronauts after watching the live launch. This video also appears on two other city-level accounts and one county-level account. Another video created by Xiangtan Zaixian (湘潭在线), the Douyin account managed by the Xiangtan Daily Newspaper, shows how the ultra-high-temperature-tolerant cables created by a Xiangtan company contributed to the successful launch of the Tianhe Space Station. The diversity of the content created by local accounts under the topic of the Tianhe Launch provides further evidence to the existence of a decentralized content creation model.

### A3.3 Content Categories

Figure A7 breaks down the video category by an account's functional affiliation. Figure A7 shows



a clear dominance of content pertaining to moral society among firefighter accounts (72%) and

security apparatus accounts (61%). Communist Youth League accounts also have a high proportion (43%) of videos portraying a moral society.

Figure A8 shows the video category for videos from central-level compared to local-level accounts.

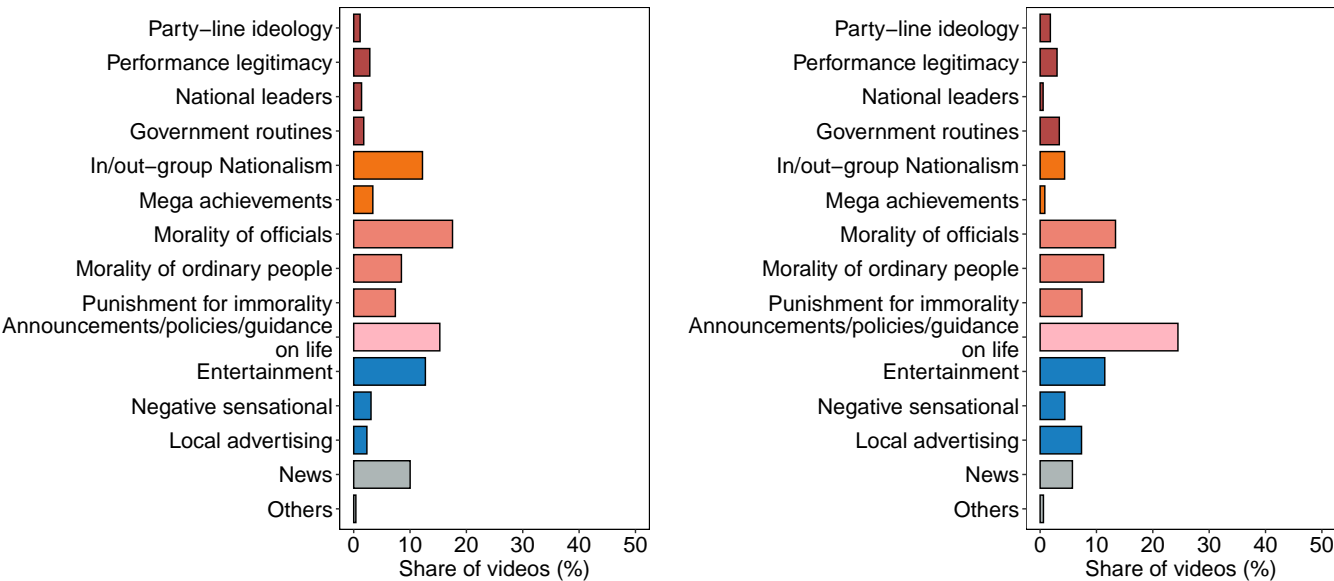


FIGURE A8. DISAGGREGATED CONTENT CATEGORIES FOR CENTRAL-LEVEL VIDEOS (LEFT) AND LOCAL-LEVEL VIDEOS (RIGHT)

Figure A9 shows the video category for videos from security and firefighting account compared to travel and broadcast related accounts.

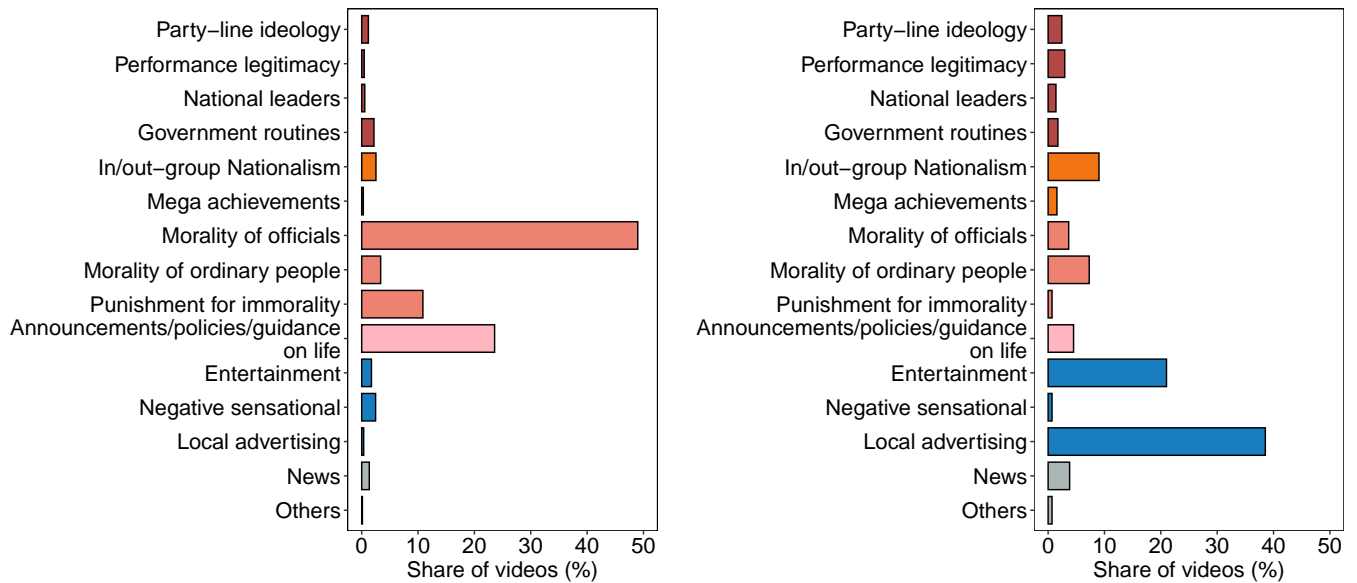


FIGURE A9. CONTENT CATEGORY OF SECURITY/FIREFIGHTER VIDEOS (LEFT) AND TRAVEL/BROADCAST VIDEOS (RIGHT)

### A3.4 User Engagement

Table A3 shows median engagement with videos in different content categories and Table A4 shows the mean engagement with videos in different content categories.

TABLE A3. ENGAGEMENT OF VIDEOS IN DIFFERENT CATEGORIES ( MEDIAN)

Video category	Number of likes	Number of comments	Number of reshares
Party-line propaganda	80	1	4
Nationalism	542	6	7
Moral Society	417	8	6
Announcements/policies/guidance on life	105	2	5
Entertainment/sensational	195	6	5
Other content	140.5	3	4

TABLE A4. ENGAGEMENT OF VIDEOS IN DIFFERENT CATEGORIES (MEAN)

Video category	Number of likes	Number of comments	Number of reshares
Party-line propaganda	7,878.5	106.7	143.8
Nationalism	37,505.5	428.3	249.7
Moral Society	16,747.6	379.1	198.0
Announcements/policies/guidance on life	3,421.6	122.6	221.5
Entertainment/sensational	6,765.3	214.0	184.2
Other content	7,675.9	219.1	165.0